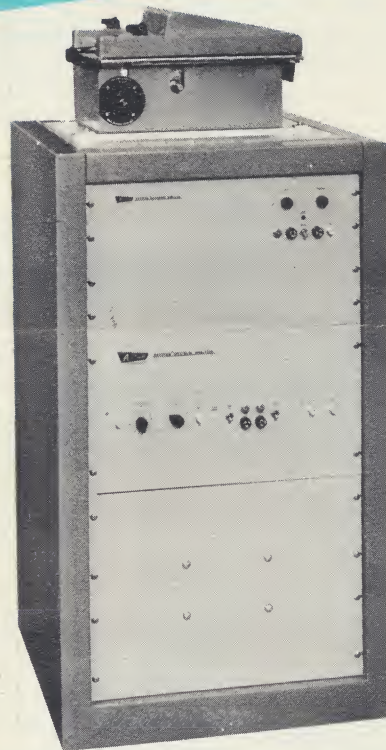
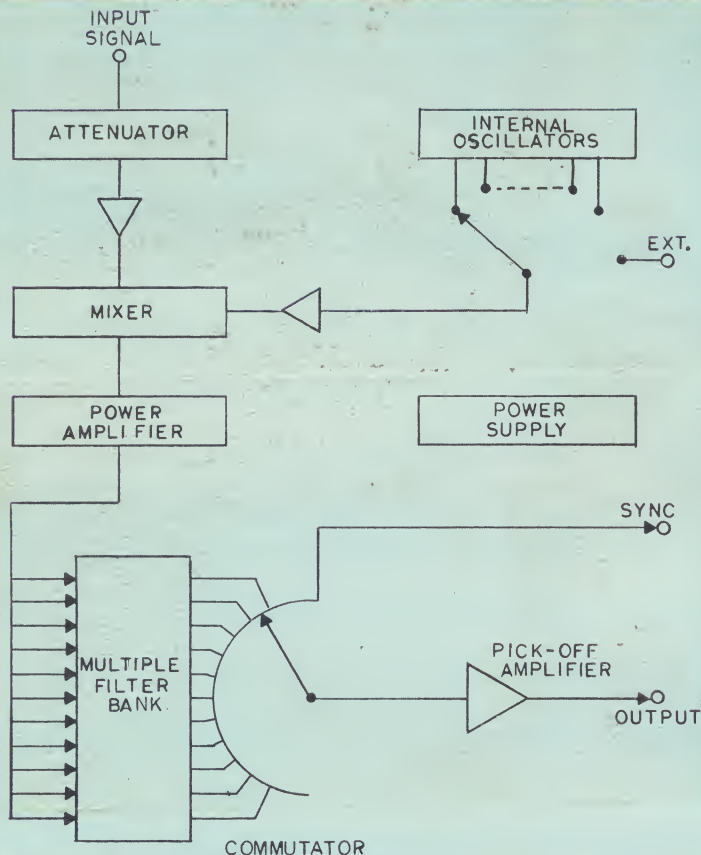


100 SERIES RAYSPAN SPECTRUM ANALYZERS



- REAL-TIME ANALYSIS
- FINE RESOLUTION
- 50 db DYNAMIC RANGE
- CHOICE OF READOUTS
- NON CONTACTING COMMUTATOR

APPLICATIONS

Real-time spectrum analysis is used in requirements which either necessitate an immediate analysis of the complete spectra or possess input signals of relatively short duration. Examples of Rayspan's application are in the analysis of speech, telemetry, heart sound, doppler radar and sonar, oceanographic sounding, shock, vibration, seismic and geophysical signals.

DESCRIPTION

The Acton Laboratories' Rayspan instruments are multiple filter spectrum analyzers capable of rapidly analyzing signals in a wide frequency band with high resolution. The Rayspan is composed of a set of bandpass filters accurately spaced over the desired frequency range in combination with a rapid scanning device which samples each filter output at rates up to 200 times per second.

Filter bandwidths may be obtained from 3 cps to 120 cps (3db bandwidth) and operating frequencies from 200 cycles per second to over 200 Kc. IF input ranges can also be provided.

A variety of displays may be used to view the analyzed spectrum. Permanent real time records may be made on a continuous paper chart using a high speed helix recorder or a multiple stylus recorder. For strictly visual display a simple amplitude-frequency oscilloscope display or an intensity modulation of a frequency time raster may be used.

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Laboratories, Inc.

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531 MAIN STREET • ACTON, MASS. 01720

PRECISION ANGLE POSITIONING DEVICES • PRECISION ELECTRONIC INSTRUMENTATION • PRECISION ROTOFLEX
TELEMETRY COMMUTATORS • INDEPENDENT ENVIRONMENTAL TESTING

FILTER ELEMENTS

The magnetostrictive filter has a number of unique features. It has substantially more stability than inductive-capacitive filters. It has the further advantage that input and output circuits are lightly coupled. The filter will operate over a wide temperature range and withstand considerable shock and vibration without adverse effects. A typical magnetostrictive filter operates in the 100KHz range, has a bandwidth of 12Hz, an input impedance of about 750 ohms, an output impedance of 2700 ohms, and a power insertion loss of 14-16 db. Upon request, more detailed specifications on individual filter elements will be provided.

OPTIONS

- Multiple Speed strip recorders, helical or multistylus
- X-Y Recorders
- Oscilloscope display in X, Y, Z, or Raster
- External oscillator panel for multiple Bands
- Panel for direct filter access
- Shaft position encoder
- Digitized output
- Computer formatted tape output
- 50 Hz, 400 Hz, or D.C. input power.
- Sweep generator for external oscilloscope display
- Wide band input receivers, audio or IF input
- Power spectral-density or averaged output
- Variable bandwidth for sub-audio use.
- Airborne configuration
- Electronic commutator under program control
- Printer output
- Spare parts kits

RAYSPAN SPECTRUM ANALYZERS

PRINCIPLES OF OPERATION

The Rayspan Spectrum Analyzer uses a multiple array of magnetostrictive filters mounted around a high speed, non contacting, capacitive commutator. The input signal is applied to the analyzer and mixed with a translating oscillator to bring the input signal to the filter frequencies. An external frequency connector may be used for analysis of other bands.

The translated signal is simultaneously applied to all of the magnetostrictive filters in the array. The individual outputs of the filters are sampled by the capacitive commutator. Three filters are sampled simultaneously. The "triplet summation" provides steep slope skirts approximately 18 db/bandwidth octave. Resolution for two equal amplitude signals is approximately $2\frac{1}{2}$ times the filter bandwidth. This definition of resolution provides a minimum of 6 db valley between two adjacent, equal amplitude signals.

The capacitive commutation can provide scan rates as high as 200 complete scans of the entire filter bank per second. This high rate is accomplished without the loss of resolution as normally experienced with sweeping gate analyzers.

The resulting output signal consists of positive pulses with amplitude proportional to signal input. The output is suitable for visual presentation on "A" scopes or for intensity modulation of frequency-time rasters. Permanent records for real-time displays may be made on high speed helical recorders or multistylus recorders. Digital outputs in various formats can also be provided as necessary.

STANDARD MODEL NUMBERS

FILTER BANDWIDTH IN CYCLES		100	50	25	12	10	5	NOTES
500 FILTERS	Model	100-40k	50-20k	25-10k	12-5k	10-4k	5-2k	Analysis Band is between 3db points
	Band	40kHz	20kHz	10kHz	5kHz	4kHz	2kHz	
250 FILTERS	Model	100-20k	50-10k	25-5k	12-2.5k	10-2k	5-1k	250 Filter Models have 2 samples per revolution
	Band	20kHz	10kHz	5kHz	2.5kHz	2kHz	1kHz	
100 FILTERS	Model	100-8k	50-4k	25-2k	12-1k	10-800	5-400	For narrower resolution inquire about action time compression units
	Band	8kHz	4kHz	2kHz	1kHz	800Hz	400Hz	
FREQ. RANGE	Low	200Hz	100Hz	50Hz	25Hz	20Hz	10Hz	
	High	200kHz	100kHz	75kHz	75kHz	75kHz	60kHz	
FILTER TIME CONSTANT	$\frac{1}{\pi BW}$	3.2 ms	6.4 ms	13 ms	26 ms	32 ms	64 ms	Time for 63% response to step
	$\frac{1}{BW}$	10 ms	20 ms	40 ms	83 ms	100 ms	200 ms	Time for 90% response to step
SAMPLING PERIOD		16.6 ms	16.6 ms	16.6 ms	16.6 ms	16.6 ms	16.6 ms	Halved on 250 models

CONTROLS:

Power on
Motor on
Local Oscillator Band Select
Signal Attenuator
Lin-Log output
Recorder Write-Standby
Recorder Shading

CONNECTORS:

Signal Input
External Local Oscillator Input
Signal Spectrum Output
Sync. Pulse Output
Power (3-wire)

INDICATORS:

Power on
Recorder-Write
Overdrive

Input-Output Characteristics:

Zin: 100,000 ohms, resistive
Minimum detectable signal: 250 μ v
Minimum signal for maximum output: 50mv
Maximum signal with maximum attenuator setting: 50 volts (Attenuator: 30 steps of 2db)
Maximum output: 6 volts peak positive pulse into 600 Ω or more

Dynamic range, single control setting, minimum visible signal to maximum undistorted signal: 50db
Standard Power requirements: 115v \pm 10%, 60 cps, 1 ϕ , 200 watts approximately.

MECHANICAL SPECIFICATIONS (Basic Unit*)

SIZE
10 $\frac{1}{2}$ " height x 19" width x 18" depth
WEIGHT
50 lbs. approx.

*NOTE: Size and weight will differ with accessories required.

July 11, 1966

(DATE)

ACTON

ACTON LABORATORIES, INC.

531 MAIN STREET, ACTON, MASSACHUSETTS 01720

(A Subsidiary of Bowmar Instrument Corporation)

TEL: 617-263-7756

TWX: 617-263-5404

Laboratories, Inc.

TECHNICAL DATA TRANSMITTAL SLIP

We are pleased to forward the following technical data:
Series 100 Rayspan data page

In reply to your recent request for additional information concerning:
the above

appearing in: **Industrial Research - March**

For additional specifications, quotations or application assistance, please
contact Mr. **Rudy Cvitan**

Field Engineer, at the address and phone number checked below:

- | | | |
|---|---|---|
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